

Starter Questions

Ellen wants to do a survey with Years 9, 10 and 11 at her school.
The table shows the number of students in each of these year groups.

Year 11	Year 10	Year 9
750	700	900

Ellen takes a sample of 50 students stratified by year group.

Work out the number of students from Year 10 in the sample.

9.1 Sampling

Simple Random Sampling

Simple random sampling is where every person or item in the population has an **equal chance** of being in the sample, and each selection is **independent** of the others.

To choose a simple random sample:

- Give a **number** to each population **member**, from a **full list** of the population
- Generate a list of **random numbers** and **match** them to the numbered members to select your sample

9.1 Sampling

Simple Random Sampling

Simple random sampling is where every person or item in the population has an **equal chance** of being in the sample, and each selection is **independent** of the others.

Advantage

Every member of the population has an **equal chance** of being selected, so it's completely **unbiased**

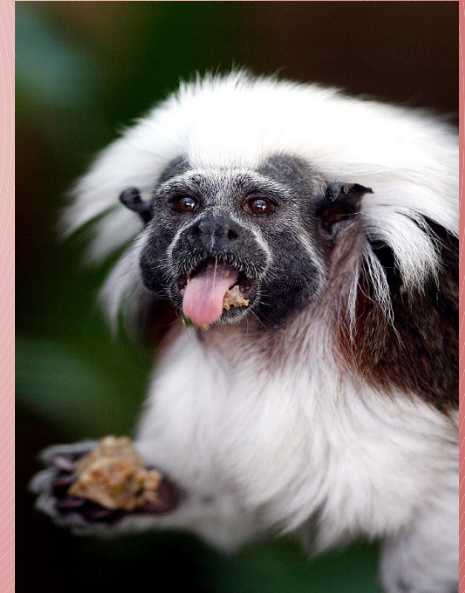
Disadvantages

It can be **inconvenient** if the population is spread over a **large area** – it might be difficult to track down the

9.1 Sampling

Simple Random Sampling Example

A zoo has 80 cotton-top tamarins. Describe how the random-number table given could be used to select a sample of five of them, for a study on tail length

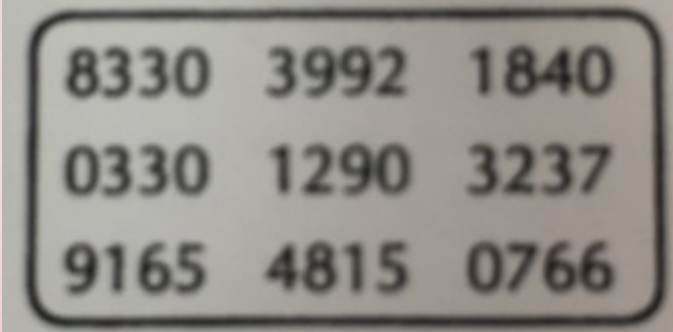


8330	3992	1840
0330	1290	3237
9165	4815	0766

9.1 Sampling

Simple Random Sampling Example

1. Create a list of the 80 cotton top tamarins. Give each a unique number between 01 and 80.
2. Use the random number table to choose five numbers. Five random numbers can be chosen by reading off every two digits that give a unique number between 01 and 80. The first five numbers are 83 (too big), 30, 39, 92 (too big), 18, 40, 03.
3. Select the cotton-top tamarins with the numbers 30, 39, 18, 40 and 03.



8330	3992	1840
0330	1290	3237
9165	4815	0766

9.1 Sampling

Systematic Sampling

Systematic sampling selects every n th member from the population you're investigating.

To choose a systematic sample:

- **Number** each member of the population from a **full list**
- Calculate a **regular interval** to use by dividing the population size by the sample size
- Generate a **random** starting point to choose the **first member** of your sample

9.1 Sampling

Systematic Sampling

Systematic sampling selects every n th member from the population you're investigating.

Advantages

- It can be used for quality control on a production line – a machine can be set up to sample every n th item
- It should give an unbiased sample

Disadvantage

If the interval coincides with a **pattern** in the population, the sample could be biased

9.1 Sampling

Systematic Sampling Example

50000 fans attended a football match. Describe how systematic sampling could be used to select a sample of 100 people.

1. Give each fan a 5-digit number between 00001 and 50000.
2. $50000 \div 100 = 500$, so select every 500th fan.
3. Use a calculator to randomly generate a starting point between 1 and 500.
4. Keep adding 500 to the starting point to find the rest of the sample.

e.g. if 239 is randomly generated, then select the fans numbered 00239, 00739, 01239, ..., 48239

9.1 Sampling

Ex9.1A Q4

Optional:

Ex1.2 from CGP